REMARKS

The Office Action dated November 25, 2005 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1, 7, 9, 13 and 22 have been amended and claims 8 and 16-21 have been cancelled. No new matter has been added through the above amendments and Applicants respectfully assert that the amendments do not raise new issues or require further consideration. Support for the above amendments may be found, for example, in Fig. 1 and its discussion in the specification. Claims 1-7, 9-15 and 22 are pending and are respectfully submitted for consideration.

Claims 1-3, 5-11, 13, 14 and 16-22 were rejected under 35 U.S.C. §102(b) as being clearly anticipated by *Sonntag* (U.S. Patent No. 5,012,142). The Office Action takes the position that *Sonntag* teaches all of the elements of those claims. Applicants respectfully traverse the above rejections according to the remarks that follow.

Claim 1 recites an oscillator, including a first phase shift circuit including a first pole, a second phase shift circuit including a second pole, and having an input coupled to an output of the first phase shift circuit and a third phase shift circuit including a third pole, and having an input coupled to an output of the second phase shift circuit, wherein an output of the third phase shift circuit is cross-coupled and directly connected to an input of the first phase shift circuit. At least one of the first, second and third poles

includes a varactor to generate a phase shift according to the at least one of the first, second and third poles. Claims 2-6, 11 and 12 depend from claim 1.

Claim 7 recites a ring oscillator having three stages, the ring oscillator having a phase shift circuit to tune a frequency of an output signal and a pole within the phase shift circuit, wherein the pole includes a varactor to provide a capacitance for the pole. The ring oscillator further includes a first stage and a final stage, wherein an output of the final stage is cross-coupled and directly connected to an input of the first stage. Claims 9 and 10 depend from claim 7.

Claim 13 recites a circuit for providing a signal, the circuit having a voltage supply, an oscillator including at least two phase shift circuits, wherein a final phase shift circuit is a cross-coupled and directly connected to a first phase shift circuit, a diode coupled to the voltage supply and the final phase shift circuit of the at least two phase shift circuits and a varactor within a pole of the final phase shift circuit, wherein the varactor tunes a frequency of a signal generated by the oscillator. Claims 14 and 15 depend from claim 13.

Claim 22 recites a circuit for generating an output signal, the circuit including applying means for applying a voltage control signal to a pole within a phase shift circuit, first generating means for generating an output signal having a frequency according to the pole and second generating means for generating a phase shift in the phase shift circuit according to the pole. The circuit further includes a first stage and a final stage, wherein

an output of the final stage is cross-coupled and directly connected to an input of the first stage.

As will be discussed below, *Sonntag* fails to teach or suggest the claimed invention. *Sonntag* is directed to a fully differential variable delay element for providing precision delays for use in digital phase-locked loops or the like. The delay in each stage is controlled by changing bias currents and the coupling of a capacitance load thereto, thereby reducing the sensitivity of the delay element to electrical noise at low bias current levels (long delay times). Included is a circuit which substantially removes any skew in the differentially delayed signals from the delay element.

In the rejections, the Office Action makes reference to disclosure in *Sonntag* that "the delay line may be adapted to operate as a voltage controlled variable frequency ring oscillator." The Office Action alleges that the oscillator in *Sonntag* must be configured in a certain manner to result in the "ring oscillator" that is discussed in *Sonntag*. The rejection alleges that the +out and –out must have been cross-coupled to the first stage to insure proper oscillation. However, as discussed in the rejection, the output of the last stage would be hooked up to the first stage via the deskewer 12.

In contrast, claim 1, for example, recites that the output of the third phase shift circuit is cross-coupled and directly connected to the input of the first phase shift circuit. In *Sonntag*, the connection back from the third stage back to the first stage would be through the deskewer 12. As such, *Sonntag* fails to teach or suggest that the output of the third phase shift circuit is cross-coupled and directly connected to the input of the first

phase shift circuit. Thus, *Sonntag* cannot anticipate such a directly connected and cross-coupled connection between the first and last. As such, Applicants respectfully assert that the rejection of claims 1-3, 5-11, 13, 14 and 16-22 is improper and should be withdrawn.

Claims 1-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Sonntag* in view of *Manna et al.* (U.S. Patent No. 6,842,078). The Office Action acknowledges that *Sonntag* fails to teach n-well MOSFETs and *Manna et al.* is cited as curing this deficiency. Applicants respectfully traverse the above rejections according to the remarks that follow.

Manna et al. is directed to a ring oscillator circuit device, where the device has an odd number of inverting stages. The inverter stages are coupled in a ring such that the output terminals of preceding inverting stages are coupled to the input terminals of subsequent inverting stages. The ring oscillator is used for analyzing load dependence of hot carrier injection. The ring oscillator is used as a voltage-controlled oscillator in a phase-locked loop circuit.

However, even if *Manna et al.* is accepted as teaching what it has been alleged, namely use of n-well MOSFETs, it does not cure the deficiencies of *Sonntag* discussed above. As such, Applicants respectfully assert that the rejection of claims 1-22 is likewise improper for at least the same reasons as indicated above.

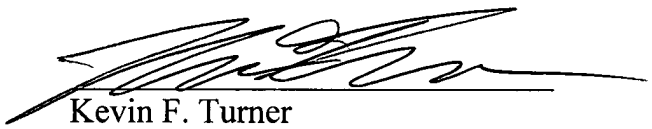
In view of the above, Applicants respectfully submit that claims 1-22 each recite subject matter which is neither disclosed nor suggested in a combination of the cited prior

art references. It is therefore respectfully requested that all of claims 1-22 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Kevin F. Turner
Registration No. 43,437

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

KFT:jf